

4.3 **As-Built Plans**

A. Overview

As-Built plans are the “As-Awarded” project plan sheets that have been revised to show changes that occurred during construction. Accurate As-Awarded and As-Built plans must be preserved for possible litigation involving construction claims and tort liability suits. As-Built plans represent the field conditions at the completion of a project.

As-Built plans may be used as reference or base mapping for future projects. Each sheet of the As-Built plans must be clearly identified as such. All plan sheets containing changes must have (at a minimum) the name of the Resident Engineer, the Construction Contract Acceptance (CCA) date, and the contract number.

The Resident Engineer is usually the most qualified individual to note the field changes that occurred (called “redline corrections”) during the construction of a project. Redline corrections are to be incorporated into the As-Awarded project CADD files using MicroStation. The Resident Engineer will confirm and approve that the CADD files were revised according to his/her “redline corrections.”

The Districts and Division of Engineering Services (DES - Structures) must submit archive-ready As-Built plans to HQ CADD within the allotted time as described in Chapter 15 of the Project Development Procedures Manual (PDPM.) For further guidance on submittal of As-Built plans to the Document Retrieval System (DRS), see Part (D).

The District is responsible for the completion of As-Built plans for all district projects (including Minor and Locally Funded Projects). The District is also responsible for obtaining archive-ready As-Built plans from consultants and Local Agencies. DES-Structures is responsible for archive-ready As-Built plans for all structures, including those prepared by design consultants and local agencies.

The date of entry of the archived-ready As-Built plans into the Document Retrieval System (DRS) will be used as the milestone date indicating the As-Built plan set has been completed. As-Built completion status will be tracked and reported on for each contract, based on the project Expenditure Authorization (EA.)

B. Roadway As-Built Plans Using CADD

When the construction of a project is done, the timely completion of the As-Built plan process must be followed as described in the Caltrans Construction Manual. The Resident Engineer, who is dealing directly with the project in question, is the most qualified individual to make the redline corrections (if there are any). The Resident Engineer can make the field changes to hard copy prints (delineation will do the transfer of the redline corrections) or directly to the As-Awarded project CADD files. But the completed As-Built plans must be finalized in the As-Awarded project CADD files (in MicroStation file format) which contains the seal and signature of the responsible Project Engineer(s) who designed the various individual plan sheets for the project.

As-Built plans shall include revisions to alignments and Right of Way, grade revisions, drainage changes, changes to roadway features and revisions in location of utility crossings and irrigation crossovers. For a complete listing of data to include on the As-Built plans, see Chapter 5 of the Construction Manual.

When using MicroStation to complete the As-Built plans, all As-Built changes will be placed on level 62 using the color red (CO=3). Revisions (changes) made in the As-Awarded plans will be denoted by lining out the original information with a light weight line (WT = 0 or 1) but the superseded information must still remain legible. Do not eradicate original figures or make corrections over them. All lettering must be legible. The changes shall be made in such a manner that they will produce good quality microfilm. To distinguish the revision text and notes from the original, the text should be a little bigger and slanted from the original information. Use the Caltrans standard font, "ctfont1," at a size of 8.75 feet (for a 1" = 50' plot scale) and at a slant of 15 degrees.

Some changes during construction are minor in nature (such as changing the length for asphalt dike or slightly shifting the location of a drainage inlet to avoid an underground pipe) and should be shown on the As-Built plans as denoted in the paragraph above. It is preferred that even minor changes have a cloud around it for easy distinction from the original design. But changes that affect the engineering design of the project (such as traffic safety devices or geometrics of the roadway) should be made through a Contract Change Order (CCO). A CCO is a legally binding document used to make changes to the contract.

Construction is the lead in handling CCOs. Depending on the nature of the change, Construction may take the responsibility for the change or when it affects the engineering design of the project, Construction must get prior concurrence from the Project Engineer if the Project Engineer is to take responsibility for the design change. Any engineered design change requires the signature and approval of a registered engineer who actually developed the design change (this may be either the original Project Engineer, the Construction Resident Engineer or their designee). The signature and approval process on Caltrans roadway projects is handled within the CCO Memorandum (thus the seal and signature of the responsible engineer does not need to be placed on the As-Built plans). For a comprehensive look at how the CCO process works, see Chapter 5 of the Construction Manual.

All engineered design changes made during construction (usually initiated by a CCO) must be shown on the plans with the CCO number shown and a “cloud” around it in addition to the lining out of changed or superseded information. **NOTE:** As-Built plans may contain a second seal and signature because of an engineered design change (if desired but not necessary) but As-Awarded plans must contain only one seal and signature (the registered engineer who is responsible for the content of that specific plan sheet).

If replacement or additional sheets are generated during construction by a CCO, they must have the signature and seal of the registered engineer from the responsible functional unit (i.e. design, traffic, landscape, hydraulics, construction, etc) in the upper right corner of the standard Caltrans border sheet. Before As-Built plans can be completed for the replacement or additional plan sheets, they must contain the signature and seal of the responsible registered engineer for that specific sheet.

In the standard Caltrans cell library, there are several cells that will assist in the As-Built plan process. Three cells used for developing As-Built plans are “asblt1,” “asblt2” and “asblt3” and are listed below:

“asblt1” = For any sheet (except title sheet) with no redline corrections.

AS BUILT (NO CORRECTIONS ON THIS SHEET) CONTRACT No. _____ C.C.A. DATE _____ R.E. NAME _____

“asb12” = For any sheet (except title sheet) with redline corrections.

AS BUILT
 CONTRACT No. _____
 C.C.A. DATE _____
 R.E. NAME _____

“asbIt3” = Only for title sheet. Electronic signature for final approval of the As-Built information by the Resident Engineer (per section 5-104D (1) of the Construction Manual.)

AS BUILT	
CONTRACT No.	_____
C.C.A. DATE	_____
R.E. NAME	_____
<i>R.E. Signature for final approval of As-built information</i>	

Upon completion of the As-Built plans, TIFF files of the As-Built plans will be created from the MicroStation files and stored in the DRS. These TIFF files will then be microfilmed for long-term storage (see Part (E) for Microfilming of As-Built plans).

If the As-Built plans are going to be kept as MicroStation design files, the cell “asblt4,” which is in the Caltrans cell library, should be utilized. The project engineer’s signature must be removed and replaced with “asblt4.” The reasons and procedures for the removal of an engineer’s electronic signature are addressed in the 1995 Weaver Memo “Electronic Signatures.”

“asblt4” = For replacing the Project Engineer’s signature on the As-Built plans, but only if the As-Built plans are to be kept as MicroStation design files.



The signature information for each engineer resides on level 63. The engineers seal information resides on level 10. The removal of the signature and the placement of “asblt4” can be done in batch mode to expedite the process.

C. Structure As-Built Plans Using CADD

After construction is complete, the As-Built plans redline corrections can be placed on either a hardcopy set of the As-Awarded (Second Notice) plans or a copy of the “Second Notice” project CADD files. For redline corrections made, the Structure Representative uses the records of changes made to the structures during construction, to redline a set of contract plans. The corrections are shown, in red, to depict what was actually constructed. The Structure Representative then sends the As-Built plans redline corrections (either hardcopy or electronic) to DES Structure Construction. Structure Construction will log the redline corrections and forward them to the appropriate Design Branch (which may be a consultant if it was a consultant design project.)

When making the redline corrections on a copy of the As-Awarded project CADD files, a MicroStation redline program is used by the Structure Representative. Changes are to be made on Level 62 using Color 62 (per the structures color table.) Drafting standards will be maintained using Caltrans Metric Structural Detailing Standards or Caltrans U.S Customary Units Structural Detailing Standards. Contact DES-Structures for further information about detailing standards.

The appropriate Design Branch or consultant (if it was a consultant design project) will finalize the As-Built plan process. The Design Branch or consultant will request the "Second Notice" files to add the redline corrections. The responsible project engineer must submit the form DS-D0144 (Change to Contract Drawings) or DS-D0144E (Request for Electronic Contract Drawings) to the Structure Design Document Unit to obtain hardcopies of the "Second Notice" files. The DS-D0144E form must also be sent to DES CADD Services in order to obtain the "Second Notice" original project CADD files (in MicroStation file format.) For more information please see Bridge Memo To Designers 1-16.

The Design Branch or consultant must follow the procedures for As-Built redline corrections as outlined in the Bridge Design Details Manual, pages 1-20.1 through 1-20.5, and Chapter 5 of the Construction Manual.

D. Archive Ready As-Built Plans

After completion of the As-Built plans using MicroStation, archive-ready TIFF image files are to be created by plotting from the MicroStation file. Procedures for plotting TIFF images generated by "TIFF Output" can be found in Section 5.6 of this manual. These TIFF files must contain the Engineer of Record seal and signature. The archive-ready TIFF files are to be sent by the District and DES to the DRS Unit for microfilming and for inclusion in the DRS.

Districts are responsible for all district projects (including Minor and Locally Funded Projects.) The District is also responsible for obtaining archive-ready As-Built plans from consultants and Local Agencies.

DES is responsible for all structure projects (including those projects prepared by design consultants and local agencies.) In addition to providing the TIFF files to the DRS Unit, DES will continue submitting these archive-ready As-Built plans to Structure Maintenance and Investigation (SM&I) for inclusion in the Bridge Inspection Retrieval Information System (BIRIS.) BIRIS is the official repository for structures As-Built plans for official use.

E. Microfilming of As-Built Plans

The DRS Unit will be responsible for administering a contract for microfilming all As-Built plan sheets statewide (including Minor and Locally Funded Projects.) The archived-ready TIFF files will be utilized to create the microfilm copies of the roadway and structure plan sheets. The DRS Unit will send the archived-ready TIFF files to the microfilm vendor.

Districts have the option of administering their own microfilming contracts as long as they follow established standards. Districts should refer to the DRS website for microfilming standards. If the Districts administer their own microfilming contracts, they must send the DRS Unit the microfilm transmittal information in addition to the archive-ready TIFF files.

Sheet name abbreviations for each individual As-Built plan sheet will appear on each aperture card and will be completed by the microfilm vendor. The aperture card format limits the abbreviation to five characters. When Districts submit the transmittal spreadsheet when submitting archive-ready TIFF image files to the DRS Unit, they have the option of including the complete sheet name or the sheet name abbreviation used for aperture cards. For a list of the aperture card sheet name abbreviations, see the DRS website. When the TIFF files are placed in the DRS, the complete sheet name is generally used.

Upon completion of microfilming, the microfilm vendor will submit one diazo copy of the aperture cards to the District for review. Included with each box of aperture cards submitted by the microfilm vendor will be a log sheet describing the contents of the box. The DRS website has a description of the log sheet.

Each District is responsible for verifying the legibility and accuracy of each microfilm aperture card. Quality checks of the aperture cards are to be made by the District for the entire project (including both roadway and structure portions.) Problems and errors must be immediately reported to the microfilm vendor and to the DRS Unit. After verification and quality checks by the District, one diazo and one original silver halide copy of each microfilmed plan sheet will be sent to the DRS Unit by the microfilm vendor. The DRS Unit will then send the aperture cards to the HQ Microfilm Unit.

If hard copy plans were given to the microfilm vendor by the District to create the aperture cards, then the vendor will send the hard copy plans back to the District.

Microfilming of Encroachment Permit As-Built plan sheets is the responsibility of the HQ Microfilm Unit. The Encroachment Permit As-Built plan sheets are to continue to be submitted by the District Encroachment Permit Engineer, to the microfilm vendor for microfilming. These As-Built are to be 34 X 44 inch paper plan sheets. Each Encroachment Permit plan sheet must be indexed consistent with the procedures on the DRS website.